

AMENDMENTS TO THE CLAIMS

Claims 70, 72-79, 92-94, 123, 124, 127-133 and 135-138 are pending in this application. The amendments made herein presume entry of the amendment submitted in the Amendment After Final, mailed May 27, 2004. This listing of claims replaces all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-69 are cancelled.

70. (Currently amended) An array of nucleic acid probes, wherein:

each probe has a double-stranded portion; a terminal single-stranded portion; and a random ~~variable~~ nucleotide sequence within the single-stranded portion, wherein the random sequence is not at the 5'-terminus or the 3'-terminus.

71. (Cancelled)

72. (Previously presented) The array of claim 70, wherein the double-stranded portion is between about 3-20 nucleotides and the single-stranded portion is between about 3-20 nucleotides.

73. (Currently amended) The array of claim 70, wherein the probes are fixed to ~~[[a]]~~ the solid support by conjugating to a coupling agent selected from the group consisting of antibody/antigen, biotin/streptavidin, *Staphylococcus aureus* protein A/IgG antibody F_c fragment, nucleic acid/nucleic acid binding protein, and streptavidin/protein A chimeras.

74. (Currently amended) An array of nucleic acid probes, wherein each probe comprises:

a single-stranded first nucleic acid of about 15-25 nucleotides in length;
a longer single-stranded second nucleic acid of about 20-30 nucleotides in length, comprising a nucleotide sequence complementary to the first nucleic acid and a ~~variable~~ random terminal nucleotide sequence of between about 3-10 nucleotides in length; and

an oligonucleotide of about 4-20 nucleotides in length, comprising a random nucleotide sequence, wherein:

the first nucleic acid is hybridized to the second nucleic acid to form a hybrid having a double-stranded portion and a single-stranded portion; and

the oligonucleotide is ligated to the ~~variable~~ random nucleotide sequence of the second nucleic acid.

75. (Currently amended) The array of claim 74, wherein the nucleic acids in the array are ~~which is~~ fixed to a solid support ~~support, wherein the solid support is~~ selected from the group consisting of plastics, ceramics, metals, resins, gels, membranes, and chips.

76. (Previously presented) The array of claim 74, wherein the solid support is a two-dimensional or a three-dimensional matrix with multiple probe binding sites.

77. (Previously Presented) The array of claim 70, wherein the probes are labelled with a detectable label.

78. (Previously Presented) The array of claim 77, wherein the detectable label is selected from the group consisting of a radioisotope, a stable isotope, an enzyme, an antibody, a fluorescent chemical, a luminescent chemical, a chromatic chemical, and a metal.

79. (Previously Presented) The array of claim 70, wherein the nucleic acids are DNA, RNA, Protein Nucleic Acid (PNA), or a combination thereof.

Claims 80-91 are cancelled.

92. (Previously presented) The array of claim 74, wherein the probes are labelled with a detectable label.

93. (Previously presented) The array of claim 92, wherein the detectable label is selected from the group consisting of radioisotope, a stable isotope, an enzyme, an antibody, a fluorescent chemical, a luminescent chemical, a chromatic chemical, and a metal.

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94. (Previously presented) The array of claim 74, wherein the nucleic acids are DNA, RNA, Protein Nucleic Acid (PNA), or a combination thereof.

Claims 95-122 are cancelled.

123. (Previously presented) The array of claim 74, wherein the probes are fixed to a solid support by conjugating to a coupling agent selected from the group consisting of antibody/antigen, biotin/streptavidin, *Staphylococcus aureus* protein A/IgG antibody F_c fragment, nucleic acid/nucleic acid binding protein, and streptavidin/protein A chimeras.

124. (Currently amended) The array of claim 74, wherein the random variable region is of length R and the array comprises about 4^R [[4ⁿ]] different nucleic acid probes.

Claims 125 and 126 are cancelled.

127. (Currently amended) An array of nucleic acid probes, wherein each probe comprises a single-stranded portion at one terminus, a double-stranded portion at the opposite terminus, and a variable nucleotide sequence within the single-stranded portion, wherein

~~the single stranded portion of each probe comprises a predetermined sequence of fixed and non-fixed positions; and~~

~~the array is probes are divided into subarrays four subsets, wherein for each subarray subset, one of the four nucleic acid bases is selected and a selected base of the nucleotide sequence occupies a defined number of positions in each probe the fixed positions of the probes and all other bases except the selected base occupy the remaining are used in the non-fixed positions such that the fixed positions of the different subarrays are occupied by a different selected base.~~

128. (Previously presented) The array of claim 138, wherein the coupling agent is selected from the group consisting of antibody/antigen, biotin/streptavidin, *Staphylococcus aureus* protein A/IgG antibody F_c fragment, nucleic acid/nucleic acid binding protein, and streptavidin/protein A chimeras.

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129. (Previously Presented) The array of claim 127, wherein the probes are labelled with a detectable label.

130. (Previously Presented) The array of claim 129, wherein the detectable label is selected from the group consisting of a radioisotope, a stable isotope, an enzyme, an antibody, a fluorescent chemical, a luminescent chemical, a chromatic chemical, and a metal.

131. (Previously Presented) The array of claim 127, wherein the nucleic acids are DNA, RNA, Protein Nucleic Acid (PNA), or a combination thereof.

132. (Previously Presented) The array of claim 127, wherein the solid support is selected from the group consisting of plastics, ceramics, metals, resins, gels, membranes, and chips.

133. (Previously Presented) The array of claim 127, wherein the solid support is a two-dimensional or a three-dimensional matrix with multiple probe binding sites.

134. (Cancelled)

135. (Previously presented) The array of claim 127, wherein the non-fixed positions of the probes are occupied by a base analog.

136. (Currently amended) The array of claim 74, wherein the ~~constant~~ double-stranded portion of each probe includes an enzyme recognition site.

137. (Currently amended) The array of claim 127, wherein the nucleic acids in the array are ~~which is~~ fixed to a solid support.

138. (Previously presented) The array of claim 127, wherein the probes are fixed to a solid support by conjugating to a coupling agent.